

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Withdrawn) A dopaminergic neuron proliferative progenitor cell marker polynucleotide probe comprising a sequence selected from the following nucleotide sequences (1) to (5):

- (1) a nucleotide sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2;
- (2) a nucleotide sequence complementary to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO: 3 or 4;
- (3) a nucleotide sequence complementary to a nucleotide sequence encoding a sequence lacking a transmembrane domain in an amino acid sequence of SEQ ID NO: 3 or 4;
- (4) a nucleotide sequence that hybridizes under stringent conditions with a polynucleotide consisting of a nucleotide sequence of SEQ ID NO: 1 or 2; and,
- (5) a nucleotide sequence comprising at least 15 contiguous nucleotides selected from sequences of (1) to (4).

2. (Currently Amended) A method for selecting a dopaminergic neuron proliferative progenitor cell, wherein the method comprises the step of contacting the a dopaminergic neuron proliferative progenitor cell marker polynucleotide probe of claim 1 with a cell sample thought to comprise a dopaminergic neuron proliferative progenitor cell, wherein the polynucleotide probe comprises a sequence selected from the following nucleotide sequences (1) to (5):

- (1) a nucleotide sequence complementary to a nucleotide sequence of SEQ ID NO: 1;

- (2) a nucleotide sequence complementary to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO: 3;
- (3) a nucleotide sequence complementary to a nucleotide sequence encoding a sequence lacking a transmembrane domain in an amino acid sequence of SEQ ID NO: 3;
- (4) a nucleotide sequence that hybridizes under stringent conditions with a polynucleotide consisting of a nucleotide sequence of SEQ ID NO: 1, wherein said stringent conditions are hybridization in 2X SSC, 0.1% SDS, at 65°C; and,
- (5) a nucleotide sequence comprising at least 15 contiguous nucleotides selected from sequences of (1) to (4).

3. (Withdrawn) A method for selecting a dopaminergic neuron lineage cell, wherein the method comprises the steps of:

- (1) selecting a dopaminergic neuron proliferative progenitor cell using the method of claim 2 for selecting the dopaminergic neuron proliferative progenitor cell;
- (2) culturing the proliferative progenitor cell selected in step (1); and
- (3) screening the cells cultured in step (2) by using a marker for a postmitotic dopaminergic neuron.

4. (Withdrawn) A dopaminergic neuron proliferative progenitor cell, which is selected by the method of claim 2.

5. (Withdrawn) A method for isolating a dopaminergic neuron proliferative progenitor cell-specific gene and a gene specific for each maturation stage from the proliferative progenitor cell to a dopaminergic neuron, wherein the method comprises the step of detecting

and isolating a gene specifically expressed in the proliferative progenitor cell of claim 4 or a cell which is differentiated, induced, or proliferated from the proliferative progenitor cell.

6. (Withdrawn) A method of screening for a compound which regulates proliferation and/or differentiation of a dopaminergic neuron lineage cell using maturation as an index, wherein the method comprises the steps of: contacting a test substance with the proliferative progenitor cell of claim 4 or a cell which is differentiated, induced, or proliferated from the proliferative progenitor cell; and detecting a change of the proliferative progenitor cell or the progenitor cell caused by the contact.

7. (Withdrawn) An antibody against a polypeptide selected from the following (1) to (6):

- (1) a polypeptide encoded by a polynucleotide consisting of a nucleotide sequence of SEQ ID NO: 1 or 2;
- (2) a polypeptide comprising an amino acid sequence of SEQ ID NO: 3 or 4;
- (3) a polypeptide comprising an amino acid sequence lacking a transmembrane domain in an amino acid sequence of SEQ ID NO: 3 or 4;
- (4) a polypeptide comprising an amino acid sequence with a deletion, insertion, substitution, or addition of one or more amino acids in an amino acid sequence of SEQ ID NO: 3 or 4;
- (5) a polypeptide encoded by a polynucleotide that hybridizes under stringent conditions with a polynucleotide consisting of a sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2; and,
- (6) a polypeptide that is a fragment of a polypeptide of (1) to (5) comprising at least eight amino acid residues.

8. (Withdrawn) The antibody of claim 7, which is produced by the hybridoma FERM BP-10315 or FERM BP-10316.

9. (Withdrawn) A dopaminergic neuron progenitor cell marker antibody, which comprises the antibody of claim 7.

10. (Withdrawn) A method for selecting a dopaminergic neuron progenitor cell, wherein the method comprises the step of contacting the antibody of claim 7 with a cell sample thought to comprise a dopaminergic neuron progenitor cell.

11. (Withdrawn) A method for selecting a dopaminergic neuron lineage cell, wherein the method comprises the steps of:

- (1) selecting a dopaminergic neuron proliferative progenitor cell using the method of claim 10 ;
- (2) culturing the progenitor cell selected in step (1); and
- (3) screening the progenitor cells cultured in step (2) by using a marker for a postmitotic dopaminergic neuron.

12. (Withdrawn) A dopaminergic neuron progenitor cell, which is selected by the method of claim 10.

13. (Withdrawn) A method for isolating a dopaminergic neuron progenitor cell-specific gene and a gene specific for each maturation stage from the progenitor cell to a dopaminergic neuron, wherein the method comprises the step of detecting and isolating a gene specifically expressed in the progenitor cell of claim 12 or a cell which is differentiated, induced, or proliferated from the progenitor cell.

14. (Withdrawn) A method of screening for a compound which regulates proliferation and/or differentiation of a dopaminergic neuron lineage cell using maturation as an index, wherein the method comprises the steps of: contacting a test substance with the progenitor cell of claim 12 or a cell which is differentiated, induced, or proliferated from the progenitor cell; and detecting a differentiated or proliferated progenitor cell caused by the contact.

15. (Withdrawn) A kit for treating Parkinson's disease, which comprises the dopaminergic neuron proliferative progenitor cell of claim 4 or the dopaminergic neuron progenitor cell of claim 12.

16. (Withdrawn) A method for treating Parkinson's disease, wherein the method comprises the step of transplanting the dopaminergic neuron proliferative progenitor cell of claim 4 or the dopaminergic neuron progenitor cell of claim 12 into the brain of a patient.

17. (Withdrawn) A use of the dopaminergic neuron proliferative progenitor cell of claim 4 or the dopaminergic neuron progenitor cell of claim 12, for producing a kit for treating Parkinson's disease.

18. (Currently Amended) A method for detecting or selecting a dopaminergic neuron proliferative progenitor cell, which comprises the step of contacting a cell sample comprising the dopaminergic neuron proliferative progenitor cell with a second polynucleotide which hybridizes under stringent conditions with a first polynucleotide consisting of any one of:

- (1) the nucleotide sequence of SEQ ID NO: 1-~~or~~2;
- (2) a nucleotide sequence consisting of a polynucleotide encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO: 3-~~or~~4;
- (3) a nucleotide sequence consisting of a polynucleotide encoding a polypeptide consisting of an amino acid sequence which lacks a transmembrane region in the amino acid sequence of SEQ ID NO: 3-~~or~~4; and
- (4) a nucleotide sequence consisting of a polynucleotide which hybridizes with a complimentary strand of a polynucleotide consisting of the nucleotide sequence of SEQ ID NO: 1 ~~or~~2 under stringent conditions, wherein said stringent conditions are hybridization in 2X SSC, 0.1% SDS, at 65°C.

19. (Original) The method of claim 18, wherein the second polynucleotide comprises at least 15 nucleotides.

20. (Withdrawn) A dopaminergic neuron proliferative progenitor cell population, which is selected by the method of claim 18.

21. (Withdrawn) A reagent for discriminating a dopaminergic neuron proliferative progenitor cell, which comprises a second polynucleotide as an active ingredient which hybridizes under stringent conditions with a first polynucleotide consisting of any one of:

- (1) the nucleotide sequence of SEQ ID NO: 1 or 2;
- (2) a nucleotide sequence consisting of a polynucleotide encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO: 3 or 4;
- (3) a nucleotide sequence consisting of a polynucleotide encoding a polypeptide comprising an amino acid sequence which lacks a transmembrane region in the amino acid sequence of SEQ ID NO: 3 or 4; and
- (4) a nucleotide sequence consisting of a polynucleotide which hybridizes with a polynucleotide consisting of the nucleotide sequence of SEQ ID NO: 1 or 2 under stringent conditions.

22. (Withdrawn) The method of claim 21, wherein the second polynucleotide comprises at least 15 nucleotides.

23. (Previously Presented) A method for producing a postmitotic dopaminergic neuron precursor cell, wherein the method comprises the steps of:

- (1) selecting a dopaminergic neuron proliferative progenitor cell by the method of claim 18;
- (2) culturing the cell selected in step (1); and
- (3) selecting the postmitotic dopaminergic neuron precursor cell from the cells cultured in step (2).

24. (Previously Presented) A method for producing a dopaminergic neuron, wherein the method comprises the steps of:

- (1) selecting a dopaminergic neuron proliferative progenitor cell by the method of claim 18; and
- (2) culturing the cell selected in step (1).

25. (Original) The method of claim 24, further comprising the step of:
(3) selecting a dopaminergic neuron from the cells cultured in step (2).

26. (Withdrawn) A method for detecting or selecting a dopaminergic neuron progenitor cell, which comprises the step of contacting a cell sample comprising the dopaminergic neuron progenitor cell with an antibody which is bound to a polypeptide consisting of the amino acid sequence of any one of:

- (1) the amino acid sequence of SEQ ID NO: 3 or 4;
- (2) an amino acid sequence which lacks a transmembrane region in the amino acid sequence of SEQ ID NO: 3 or 4;
- (3) an amino acid sequence mutated by one or more amino acid deletions, substitutions, or additions, or any combination thereof, in the amino acid sequence of SEQ ID NO:3 or 4; and
- (4) an amino acid sequence consisting of a polypeptide encoded by a polynucleotide which hybridizes under stringent conditions with a polynucleotide consisting of a nucleotide sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2, or a partial sequence thereof.

27. (Withdrawn) The method of claim 26, wherein the polypeptide comprising the partial sequence comprises at least six consecutive amino acid residues.

28. (Withdrawn) A dopaminergic neuron progenitor cell population, which is selected by the method of claim 26.

29. (Withdrawn) The cell population of claim 28, which comprises 40% or more dopaminergic neuron progenitor cells in the entire cells.

30. (Withdrawn) A reagent for discriminating a dopaminergic neuron progenitor cell, which comprises an antibody as an active ingredient which is bound to a polypeptide consisting of the amino acid sequence of any one of:

- (1) the amino acid sequence of SEQ ID NO: 3 or 4;
- (2) an amino acid sequence which lacks a transmembrane region in the amino acid sequence of SEQ ID NO: 3 or 4;
- (3) an amino acid sequence mutated by one or more amino acid deletions, substitutions, or additions, or any combination thereof, in the amino acid sequence of SEQ ID NO:3 or 4; and
- (4) an amino acid sequence consisting of a polypeptide encoded by a polynucleotide which hybridizes under stringent conditions with a polynucleotide consisting of a nucleotide sequence complementary to a nucleotide sequence of SEQ ID NO: 1 or 2, or a partial sequence thereof.

31. (Withdrawn) The reagent of claim 30, wherein the polypeptide consisting of the partial sequence comprises at least six consecutive amino acid residues.

32. (Withdrawn) The reagent of claim 30, wherein the antibody is produced by the hybridoma FERM BP-10315 or FERM BP-10316.

33. (Withdrawn) An antibody produced by the hybridoma FERM BP-10315 or FERM BP-10316.

34. (Withdrawn) A method for producing a dopaminergic neuron proliferative progenitor cell, wherein the method comprises the steps of:

- (1) selecting a dopaminergic neuron progenitor cell by the method of claim 26; and

(2) removing a postmitotic dopaminergic neuron precursor cell to select the dopaminergic neuron proliferative progenitor cell.

35. (Withdrawn) A method for producing a postmitotic dopaminergic neuron precursor cell, wherein the method comprises the steps of:

(1) selecting a dopaminergic neuron progenitor cell by the method of claim 26; and
(2) culturing the cell selected in step (1).

36. (Withdrawn) The method of claim 35, further comprising the step of:

(3) selecting a postmitotic dopaminergic neuron precursor cell from the cells cultured in step (2).

37. (Withdrawn) A method for producing a dopaminergic neuron, wherein the method comprises the steps of:

(1) selecting a dopaminergic neuron progenitor cell by the method of claim 26; and
(2) culturing the cell selected in step (1).

38. (Withdrawn) The method of claim 37, further comprising the step of:

(3) selecting a dopaminergic neuron from the cells cultured in step (2).

39. (Withdrawn) A kit for treating a neurodegenerative disease, which comprises at least one cell selected from the group consisting of:

(1) the dopaminergic neuron proliferative progenitor cell population of claim 20;
(2) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 23;
(3) a dopaminergic neuron produced by the method of claim 24;
(4) a dopaminergic neuron produced by the method of claim 25;
(5) the dopaminergic neuron progenitor cell population of claim 28;

- (6) the dopaminergic neuron progenitor cell population of claim 29;
- (7) a dopaminergic neuron proliferative progenitor cell produced by the method of claim 34;
- (8) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 35;
- (9) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 36;
- (10) a dopaminergic neuron produced by the method of claim 37; and
- (11) a dopaminergic neuron produced by the method of claim 38.

40. (Withdrawn) The kit of claim 39, wherein the neurodegenerative disease is Parkinson's disease.

41. (Withdrawn) A method for treating a neurodegenerative disease, which comprises the step of transplanting into the brain of a patient at least one cell selected from the group consisting of:

- (1) the dopaminergic neuron proliferative progenitor cell population of claim 20;
- (2) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 23;
- (3) a dopaminergic neuron produced by the method of claim 24;
- (4) a dopaminergic neuron produced by the method of claim 25;
- (5) the dopaminergic neuron progenitor cell population of claim 28;
- (6) the dopaminergic neuron progenitor cell population of claim 29;
- (7) a dopaminergic neuron proliferative progenitor cell produced by the method of claim 34;
- (8) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 35;
- (9) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 36;

- (10) a dopaminergic neuron produced by the method of claim 37; and
- (11) a dopaminergic neuron produced by the method of claim 38.

42. (Withdrawn) The method of claim 41, wherein the neurodegenerative disease is Parkinson's disease.

43. (Withdrawn) A use of at least one cell for producing a kit for treating a neurodegenerative disease, wherein the cell is selected from the group consisting of:

- (1) the dopaminergic neuron proliferative progenitor cell population of claim 20;
- (2) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 23;
- (3) a dopaminergic neuron produced by the method of claim 24;
- (4) a dopaminergic neuron produced by the method of claim 25;
- (5) the dopaminergic neuron progenitor cell population of claim 28;
- (6) the dopaminergic neuron progenitor cell population of claim 29;
- (7) a dopaminergic neuron proliferative progenitor cell produced by the method of claim 34;
- (8) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 35;
- (9) a postmitotic dopaminergic neuron precursor cell produced by the method of claim 36;
- (10) a dopaminergic neuron produced by the method of claim 37; and
- (11) a dopaminergic neuron produced by the method of claim 38.

44. (Withdrawn) The use of claim 43, wherein the neurodegenerative disease is Parkinson's disease.